PANDEMIC: BUILDING THE PERFECT PLAGUE

Subject: Health | **Current:** 2009 | **Grade:** 9-12 **Day:** 2 of 2

1 Purpose

To describe a pandemic, emphasizing the interaction of factors in day-to-day life and specific disease characteristics that influence the spread of the illness.

2 Duration of Lesson

50 minutes

3 Additional Topics Addressed

Social Studies

4 Objectives

At the conclusion of this lesson, students will be able to:

- define common terms associated with the progression of a pandemic
- describe the effects of various disease symptoms and characteristics on infectivity, lethality and visibility of a disease
- explain how disease characteristics interact with factors in day-to-day life to influence the spread of disease

5 Standards Addressed & Benchmarks

HEALTH CAREERS EDUCATION:

Introduction to Health Care Systems

The disease process: Describe behaviors that reduce risks of infectious diseases.	HCSY.9
Diagram and explain the infectious disease process.	HCSY.9.1
Name disease causing microorganisms.	HCSY.9.2

Describe common signs/symptoms of infectious diseases. **HCSY.9.5**

SOCIAL STUDIES- GEOGRAPHY OF HISTORY AND THE WORLD

Students will examine the physical and human geographic factors associated with examples of how humans interact with the environment, such as deforestation, natural hazards and the spread of diseases, and the regional and global consequences of these interactions. **GHW.9**

Distinguish and assess the human and physical factors associated with the spread of selected epidemics and/or pandemics over time and describe the impact of this diffusion on countries and regions. Propose strategies for limiting the spread of diseases. **GHW.9.4**

Example: Europe (Black Death, Bubonic Plague): spread from Central Asia, dramatic decreas in population (fourteenth century); North America (Native Americans): Europeans bringing smallpox and measles to New World (1500s); World: the cholera pandemic (1700-1800s), Influenza Pandemic (1918-1919), the AIDS epidemic (1900s); Asia and United States: the potential for a bird flu pandemic and the response by the United States with the help of the Centers for Disease Control (2007).

6 Vocabulary

These terms are included in the lesson plan:

- Infectivity – indicates how easily a disease is transmitted from person to person
- Lethality – describes how deadly a disease can be
- Visibility – indicates how easily symptoms are detected and connected to the disease

7 Materials

Materials to aide the lesson plan include:

- Pandemic 2 game simulation tutorial - http://www.crazymonkeygames.com/pandemic2/tutorial.php
- Pandemic 2 game simulation - http://www.crazymonkeygames.com/Pandemic-2.html

8 Additional Resources

Additional Resources include:

- Classroom computer with projector for viewing game simulation tutorial
- Individual computers for students to access website, completion of independent practice

9 Procedures & Methods

The lesson plan's course is as follows:

A. Introduction

Pandemic! This topic was introduced during the previous class, using a comparison of life during 1918 and now to consider day-to-day factors that influence the spread of illness. In today's lesson, the discussion will be broadened to consider key characteristics of diseases. Using a game simulation, you will learn how these disease characteristics interact with factors in daily life to dramatically influence how a disease spreads across the globe.

Before beginning the simulation, there are a few terms to introduce. The first is lethality. Basically, lethality describes how deadly the disease can be. Thinking back to the previous lesson, the 1918 Spanish flu was much more lethal than the 2009 Swine (H1N1) flu. Next is infectivity; it indicates how easily the disease is transmitted from person to person. As expected, a disease with high infectivity is much more likely to become a pandemic than one with low infectivity. The last term is visibility; it describes how easily the symptoms are detected and connected to the disease. A disease with many common symptoms (tiredness, muscle aches, headache) would be less easily detected and connected than a disease with a few unique symptoms (bright red rash on neck, coughing up blood). Together, lethality, infectivity and visibility determine the potential severity of a pandemic.

B. Development

After the introduction, the class will watch 2 tutorials over the game simulation - http://www.crazymonkeygames.com/pandemic2/tutorial.php. Students may find it helpful to take notes for use during the game simulation.

The following points should be emphasized after watching the 2 tutorials:

- Choose the virus disease class
- Choose the relaxed playing mode
- Choose the maximum speed

C. Independent Practice

Individually (or in pairs, if desired), students will run the Pandemic 2 game simulation for 20 minutes. During the simulation, students will note the region where the pandemic originated, disease characteristics (symptoms, resistance and transmission), items purchased with evolution points (and

reasoning behind these purchases), and news events reported during the simulation (and their impact on the pandemic). At the end of the 20 minutes, students will record the number of regions infected, and levels (low, moderate, high) of infectivity, lethality and visibility.

The game simulation will conclude with each student reporting to the class one item purchased with evolution points (and the reasoning behind the purchase) and one news event reported during the simulation (and its impact on the pandemic).

D. Practice

Following individual reports, the class will discuss the general progression of a pandemic. Students will be asked to identify disease characteristics that influenced infectivity, lethality and visibility and to describe how these characteristics interacted with day-to-day life to influence the spread of illness. To facilitate discussion, the teacher may ask the following questions:

- Based on your experiences in the simulation, which feature – visibility, infectivity, or lethality – is most critical in the progression of a pandemic?
- Which symptoms in the simulation had the highest infectivity? What are some practical ways to reduce the infectivity of these symptoms in real life?
- What are some examples of how day-to-day life (based on geographical location and/or news events) interacted with disease characteristics (symptoms, resistance and transmission) to increase the spread of the pandemic during the simulation?
- If you were building the perfect plague for the current season in your current geographical location, what 3 characteristics (symptoms, resistance and/or transmission) would it possess? Defend your answer.

E. Accommodations (Differentiated Instruction)

Students for whom the level of abstraction or complexity of the game simulation is too

challenging may have trouble understanding the tutorial. Teachers may need to provide a written handout of easily understandable directions to make the simulation accessible to these students.

Students who have visual, mobile or hearing impairments may need adaptive computer software to complete the simulation. Students who are ELL as well as other students who may have developmental issues may need to play the game in small groups under the direct supervision of the teacher. These students may also need a data sheet for recording and organizing their data: region where the pandemic originated, disease items purchased with evolution points, and news events reported during the simulation.

High ability/gifted students may need to play the game in realistic rather than relaxed mode to provide an appropriate level of challenge.

F. Checking for understanding

- Students will be asked to give an examples of symptoms with high visibility
- Students will be asked to identify symptoms associated with increased infectivity
- Students will be asked to show the relationship between factors in day-to-day life and the spread of illness

G. Closure

- Review terms
- Summarize the roles of infectivity, lethality and visibility in the spread of disease
- Identify related careers. Careers related to this lesson include nursing, physician, health educator, epidemiologist and laboratory technician, For more information, students may visit the following links - http://www.whatispublichealth.org/careers/index.html , http://pathwaystopublichealth.org/High-School-Students/26/ , and http://www.cdc.gov/excite/careers/ .
- Highlight the connection between factors in day-to-day life and disease characteristics in the progression of a pandemic

10 Evaluation

Students will be evaluated by their individual reports on the game simulation and participation in group discussion.

The game simulation will be graded in a pass/fail manner. Students able to identify one item purchased with evolution points (and the reasoning behind the purchase) and one news event reported during the simulation (and its impact on the pandemic) will receive full credit. Students experiencing difficulties may be assisted through open-ended questioning (i.e. How do you think the flooding in India affected the spread of the disease?) by the teacher. Students unable to meet the standards above will not receive credit.

The group discussion will be graded in a pass/fail manner. Students able to identify disease characteristics that influenced infectivity, lethality and visibility and/or describe how these characteristics interacted with day-to-day life to influence the spread of illness will receive full redit. Students experiencing

difficulties may be assisted though open-ended questioning (i.e. If you were a doctor, what kinds of symptom would you see in patients daily? What kinds of symptoms would make it easy to spread the disease from one person to another?) by the teacher. Students unable to meet the standard above will not receive credit.

A rubric for the simulation and discussion is attached.

11 Teacher Reflection

To be completed by teacher following the lesson.

12 Resources & Media

- Pandemic 2 game simulation tutorial - http://www.crazymonkeygames.com/pandemic2/tutorial.php
- Pandemic 2 game simulation - http://www.crazymonkeygames.com/Pandemic-2.html
- http://www.whatispublichealth.org/careers/index.html

	3 points	3 points	3 points
Simulation	Student is able to identify one item purchased with evolution points (and the reasoning behind the purchase) and one news event reported during the simulation (and its impact on the pandemic)	Students unable to identify one item purchased with evolution points (and the reasoning behind the purchase) or one news event reported during the simulation (and its impact on the pandemic)	Students unable to identify one item purchased with evolution points (and the reasoning behind the purchase) or one news event reported during the simulation (and its impact on the pandemic)
Discussion	Student is able to identify disease characteristics that influenced infectivity, lethality and visibility and describe how these characteristics interacted with day-to-day life to influence the spread of illness	Student is able to identify disease characteristics that influenced infectivity, lethality and visibility or describe how these characteristics interacted with day-to-day life to influence the spread of illness	Student is not able to identify disease characteristics that influenced infectivity, lethality and visibility and is not able to describe how these characteristics interacted with day-to-day life to influence the spread of illness
Points earned per column			

Total Points: